through the fissures of this rock that the water is supposed to issue, till overpowered by the increasing column of tide, which, by its greater specific gravity, will occasion it to find vent at a level which will be more above the point at which the two fluids meet in proportion to the difference of their densities.

In confirmation of this hypothesis it is further observed, that after very stormy weather, when there is an unusual swell upon that coast, the water is discharged with an evident undulation.

Dr. Storer, however, observes, that the relative altitude to which the spring is elevated after much rain, rather militates against its correctness; and he would expect the additional force of the column of spring water at such times to produce an opposite effect, by enabling it to overcome the same column of sea-water during a longer period in each tide.

As it seemed probable that the subject may be elucidated by an acquaintance with the peculiarities of the springs in the neighbourhood, the author remarks, that upon the Wolds behind Bridlington there is very little water during summer and autumn; but in the course of two or three weeks after the commencement of frost, the springs begin to run copiously, and in some instances even with considerable impetuosity.

On the Effects of simple Pressure in producing that Species of Crystallization which forms two oppositely polarized Images, and exhibits the complementary Colours by polarized Light. By David Brewster, *LL.D. F.R.S. Edin. and F.S.A. Edin. In a Letter addressed to the Right Hon. Sir* Joseph Banks, *Bart. K.B. P.R.S.* Read January 19, 1815. [*Phil. Trans.* 1815, *p.* 60.]

The author having, in former experiments on the depolarization of light by a mixture of resin and bees' wax, had reason to suppose that the effects were modified by pressure, now examines the effects of pressure on a class of substances which, from their elasticity, will restore themselves after removal of the force applied, and thence admit of greater variety in the repetition of the experiments. By employing animal jellies, he had an opportunity of giving them any degree of tenacity that might be wished.

A small cylinder of jelly being placed upright between two plates of glass, had at first no power of depolarization. By gradual drying at its circumference, it soon began to depolarize at that part; and as it became thereby more dense than at its centre, it had the power of a concave lens. At the end of three weeks it seemed dried to the centre, and had then lost both these properties; but by forcible pressure, which it could now bear without injury, it depolarized completely during the continuance of the pressure; but upon its removal, says Dr. Brewster, it resumed its uncrystallized state.

The author next employed isinglass jelly, brought nearly to the consistence of caoutchouc, which, after standing one day, had acquired the depolarizing power even when cut into thin slices; and

when forcibly compressed between two plates of glass, it also exhibited beautiful colours, that were complementary to each other in the two images of a candle seen through it, by means of a prism of Iceland spar; and when the pressure was removed, these complementary tints disappeared.

Inasmuch as these colours might be supposed owing to the thinness to which the plate of jelly was reduced by pressure, Dr. Brewster cut the cake to the same thinness which it had possessed while under compression, but without any production of colours till pressure was again applied.

In the author's concluding experiment, he formed one twentieth of an inch thick of the same jelly, by melting it between two plates of glass. When merely consolidated by cooling, this had no power of depolarization; but by pressure it instantly restored the evanescent image, and exhibited, as in the former cases, the complementary colours, showing, says the author, that pressure communicates a modification of structure correspondent to that of crystallized minerals.

Experiments made with a View to ascertain the Principle on which the Action of the Heart depends, and the Relation which subsists between that Organ and the nervous System. *By* A. P. Wilson Philip, *Physician in Worcester.* *Communicated by* Andrew Knight, *Esq. F.R.S.* Read February 9, 1815. [*Phil. Trans.* 1815, *p.* 65.]

The author's ultimate object is to ascertain the manner in which certain poisons act in destroying life; but for this purpose he found it necessary previously to determine how far the powers of the nervous and sanguiferous systems depend on each other; and though it be generally allowed that the powers of the nervous system cannot continue long after the cessation of the circulation of the blood, the converse is not so generally admitted; since there are persons who maintain that the nervous power may be wholly destroyed without impairing the vigour of the heart.

The present inquiry relates solely to this part of the subject, how far the power of the heart is influenced by the state of the nervous system; and the author designs, at some future time, to investigate experimentally, by what steps certain poisons destroy the powers of both.

M. Le Gallois maintains, that though the destruction of the brain does not impair the action of the heart, it is immediately and extremely debilitated by destruction of the cervical part of the spinal marrow. Dr. Philip, however, did not find this to be the case in his experiments, of which the first ten, performed on rabbits, relate almost exclusively to the effect of destroying the spinal marrow.

The animals were in general first rendered insensible by a blow on the occiput, after which the circulation was found to depend wholly on the continuance of respiration by artificial means, and not to be in any degree altered by subsequent removal or destruction of the spinal marrow, which was effectually done by means of a hot wire.